Case report

Retropneumoperitoneum with pneumoperitoneum after rectal perforation resulting from endoscopic polypectomy. A case report

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SUMMARY

A case of simultaneous retropneumoperitoneum and pneumoperitoneum resulting from an endoscopic polypectomy of a sessile polyp has been reported. According to the current data, we consider that the cause of the above rare clinical picture was the perforation of the extraperitoneal part of the rectum and leakage of air into retroperitoneal space. From there, the air found access to the peritoneal space following the mesocolon's blood vessels, through a microrupture of the bowel's serosa or of the posterior peritoneum. These microperforations could not be detected during the laparotomy.

Key words: Pneumoperitoneum, retropneumoperitoneum, endoscopic polypectomy

INTRODUCTION

Bowel perforation is a rare complication of endoscopic polypectomy[1]. As a result of this complication pneumoperitoneum or retropneumoperitoneum are quite common, but the coexistence of the above entities is very rare[2].

We report here a case of simultaneous retropneumoepritoneum and pneumoperitoneum, resulting from an endoscopic polypectomy of a sessile rectal polyp and we review the mechanisms, which led to this rather unusual clinical entity.

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CASE REPORT

A 53 year-old male patient with a history of endoscopic removal of adenomatous polyps in the sigmoid and descending colon, underwent a colonoscopy as part of his follow-up. The examination was carried out easily up to the caecum and revealed a sessile polyp 1.5 cm in diameter on the posterior rectal wall, 9 cm from the anal verge (Figure 1). Due to the lesion's morphology the patient was admitted to hospital and the polypectomy was scheduled for the next day. He had no significant past medical history. On physical examination he was fit and well and the laboratory data were negative.

The following day the patient underwent endoscopic polypectomy of the rectal polyp (OLYMPUS electrosurgical unit with a snare loop passed through the colonoscope). The lesion was completely removed, although deep electrocautery trauma was left (Figure 2).

Fifteen minutes after the procedure the patient started complaining of a dull ache in the lumbar region and along the vertebral spine. On examination his abdomen was moderately distended with mild diffuse tenderness on deep palpation, but there was no guarding. The chest was clear and there were no signs of subcutaneous emphysema.

With the suspicion of rectal perforation, the patient was immediately started on antibiotic treatment and he was referred for chest and abdominal radiographs, which revealed the combination of pneumoperitoneum and retropneumoperitoneum (free air in the peritoneal cavity, in the retroperitoneal space and in the mediastinum) (Figure 3, 4).

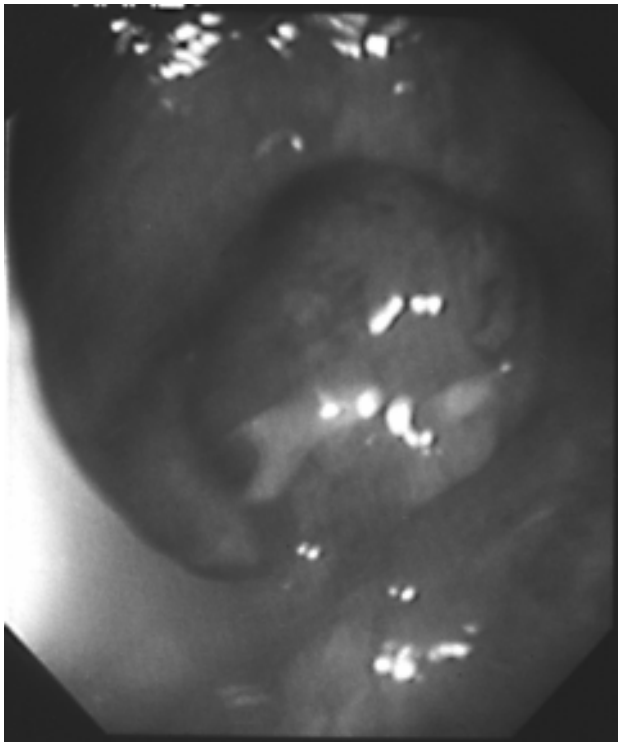

Figure 1. Rectal polyp 1.5 cm in diameter.

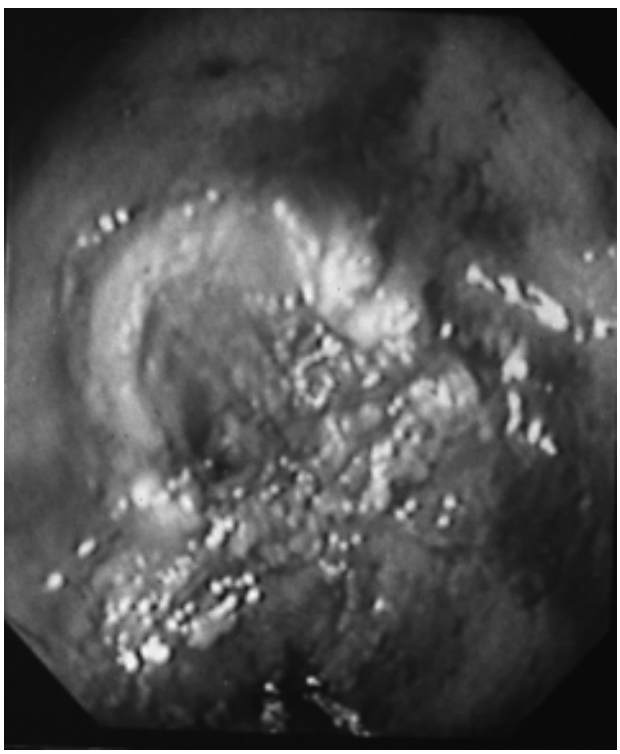

Figure 2. Post-polypectomy trauma.

Two hours later, the patient became pyrexial (38.5˚ C) and he started complaining of pain in the ribs, scapulae and around the neck. There was marked diffuse ab-

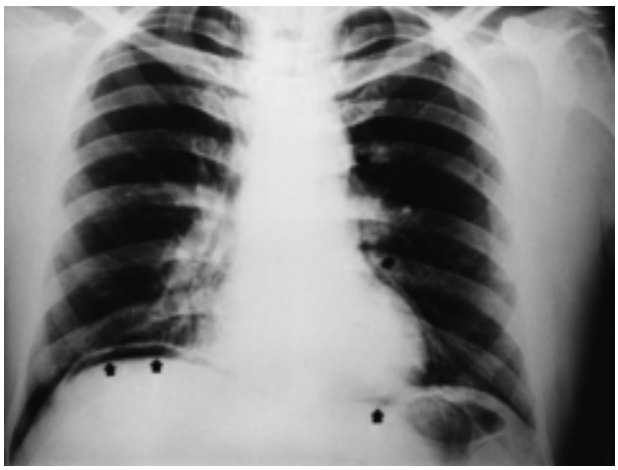

Figure 3. Presence of subdiaphragmatic air and air in the mediastinum.

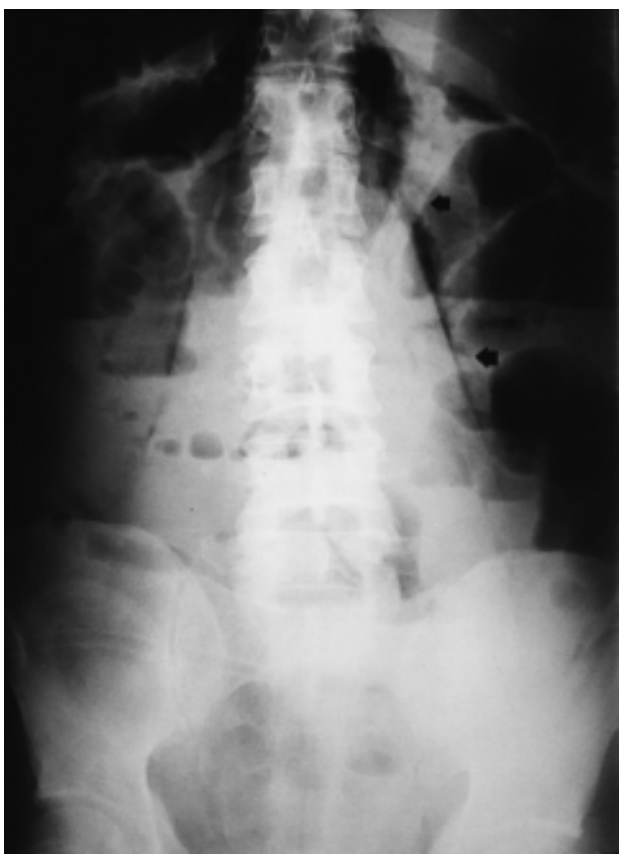

Figure 4. Retroperitoneal air is identified along the contour of the psoas muscle.

dominal tenderness, but without guarding or rebound tenderness. Hematological investigations at that time showed a white cell count of $13.9x10^9$/L with granulocytosis (94.3%). There was no dyspnoea or subcutaneous emphysema.

With the above clinicolaboratory data and with the clinical diagnosis of bowel perforation, the patient underwent early laparotomy by an experienced surgeon. The large bowel and the peritoneal cavity were thoroughly investigated, but no abnormal findings were revealed. There was no opening present in the bowel wall, no hematoma, burn, fluid or other signs consistent with perforation. A loop colostomy was made at the sigmoid colon and the abdomen was closed. The patient made an uneventful recovery and was discharged on the seventh postoperative day. The histology of the removed rectal polyp showed a villoadenomatous polyp with moderate to severe dysplasia. The colostomy was closed 6 weeks after the operation and the continuity of the bowel was reestablished. Follow up sigmoidoscopy 6 months later, revealed a regular scar at the site of the polypectomy.

DISCUSSION

Pneumoperitoneum is most commonly seen after abdominal surgery and could also be caused after perforation of a hollow viscus, after trauma and in infections of the peritoneum with gas forming microbes. Retropneumoperitoneum may result from diagnostic procedures, from a perforation of a hollow viscus (either peptic, iatrogenic or traumatic) and from infections with gas forming organisms. Despite the fact that both pneumoperitoneum and retropneumoperitoneum are quite common, the coexistence of these entities is very rare[2]. Moreover there are limited cases in the literature where nonsurgical pneumoperitoneum and retropneumoperitoneum coexist, usually caused by pneumomediastinum and pneumatosis intestinalis cystoides[3,4]. However exploration of the pancreas and liver by tomography under pneumoperitoneum and retropneumoperitoneum has been referred[5,6]. Our case represents this combination, as a complication after an endoscopic transmural burn and perforation of the extraperitoneal part of the rectum. A similar case of entoscopic perforation of the rectum presenting initially as a change of voice, has beeb recently published[7].

The peritoneal cavity is a closed sac, bounded by visceral and parietal peritoneum and limited superiorly by the diaphragm and inferiorly by the pelvic floor. It is easily distended by air or fluid and does not communicate with the retroperitoneal space. Contrary to the peritoneal, the retroperitoneal space is not a closed sac and communicates superiorly with the posterior mediastinum through the aortic hiatus of the diaphragm and inferiorly with both groins through the femoral canal. It is not easily distended, so a small amount of air will be trapped locally, while large amounts of it spread, following vertical and horizontal pathways. Horizontally it spreads via the subcutaneous tissue of the flanks and the anterior abdominal wall and presents clinically as subcutaneous emphysema. Vertically the air spreads through the areolar tissue to the posterior peritoneal space or follows the large vessels to the posterior mediastinum or inferiorly to the inguinal areas and lower limbs.

In our case the X-rays showed free air in the peritoneal cavity, in the retroperitoneal space and in the mediastinum, although there was no subcutaneous emphysema. On the other hand, thorough examination of the peritoneal cavity and the bowel during the laparotomy could not reveal any visible perforation of the bowel or of the parietal and visceral peritoneum. There are recent reports supporting that computerized tomography (CT) and even more spiral CT could become an additional diagnostic tool in such cases[8,9].

Normally retroperitoneal space does not communicate with the peritoneal cavity, however two mechanisms have been proposed to explain the coexistence of pneumoperitoneum and retropneumoperitoneum[4,10,11]. Firstly, air in the retroperitoneal space following mesocolon's blood vessels may dissect the serosa from the bowel wall with eventual perforation and leakage of air into the peritoneal cavity. Secondly, if the air in the retroperitoneal space is it a large amount, may perforate the posterior parietal peritoneum and enter into the peritoneal sac. Another possibility could be air entering the peritoneal space from the mediastinum through the diaphragm and a small perforation of the peritoneum. Only these mechanisms could explain the combination of pneumoperitoneum and retropneumoperitoneum in our case in relation to the clinical, radiological and surgical data of the patient. After the perforation of the extraperitoneal part of the rectum (9 cm from the anal verge in a tall man), air was immediately spread into the retroperitoneal space and above and following the mesocolon's vessels produced microperforation of the bowel's serosa and entered into the peritoneal cavity. This microperforation could not be visible during the laparotomy, despite thorough examination.

Regarding our patient's management, it was decided to operate after the event, due to the clinical deteriora-

tion and the possible preoperative diagnosis of perforation of the rectum at the point of the peritoneum bending. This point could involve both the intraperitoneal and the extraperitoneal space. Nevertheless, such complications could be managed conservatively with appropriate antibiotic treatment, in each individual case.

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